

GAO

Report to the Chairman, Subcommittee
on Oversight and Investigations,
Committee on Energy and Commerce,
House of Representatives

December 1991

NUCLEAR SECURITY

Safeguards and Security Weaknesses at DOE's Weapons Facilities



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**Resources, Community, and
Economic Development Division**

B-246480

December 13, 1991

The Honorable John D. Dingell
Chairman, Subcommittee on Oversight
and Investigations
Committee on Energy and Commerce
House of Representatives

Dear Mr. Chairman:

The Department of Energy (DOE) has major research, development, and production responsibilities for the nation's nuclear weapons program and owns a broad spectrum of facilities to carry out these responsibilities. The facilities house, among other things, special nuclear materials used in making nuclear weapons and nuclear weapons components. To avoid the serious consequences that could result from acts of radiological sabotage or diversion of nuclear materials to the hands of extremists, DOE must have effective safeguards and security at its facilities. DOE spends nearly \$1 billion a year to protect its nuclear weapons facilities from such acts that could endanger the nation.

On June 28, 1990, you requested that we provide you with information on safeguards and security weaknesses at these facilities. You were particularly interested in (1) the number and types of safeguards and security weaknesses that DOE has uncovered at its facilities and (2) how many of these weaknesses have been corrected, including the length of time DOE has taken to correct them. You also requested that we review the effectiveness of DOE's corrective actions for identified weaknesses. As agreed, we will report at a later date on the effectiveness of these actions.

Results in Brief

Despite the critical importance to national security of effective safeguards and security at DOE's weapons facilities, DOE security inspections have identified numerous weaknesses in this area. According to DOE's centralized information system for tracking safeguards and security weaknesses, over 2,100 weaknesses were identified at 39 of DOE's important weapons-related facilities between January 1989 and September 1990. For the most part, these facilities are engaged in nuclear materials production and nuclear weapons research and manufacture, or they are vital to the administration of the weapons program. The identified weaknesses cover a wide range of security activities, including poor performance by members of DOE's security force, poor accountability for

quantities of nuclear materials, and the inability of personnel to locate documents containing classified information. About 13 percent of the 2,100 weaknesses resulted in unsatisfactory ratings given by DOE inspectors for security activities, and another 38 percent led to a marginal rating for other security activities.

DOE's centralized safeguards and security information tracking system does not have current data on whether DOE field offices have corrected the identified weaknesses. Therefore, neither DOE nor we can precisely determine from this system which weaknesses have been corrected nor the length of time it has taken DOE to correct them. However, on the basis of our random sample test of the tracking system's information, we estimate that as of October 31, 1990, either corrective actions had not been completed or DOE had not verified that the corrective actions were effective for approximately 60 percent, or about 1,300, of the 2,100 weaknesses. Without reliable data, DOE cannot be assured that timely action is being taken to correct these weaknesses, nor can it determine whether identified weaknesses are systemic. As a result, both the effectiveness of the centralized tracking system as a management tool and DOE's ability to assess the overall effectiveness of its security program are diminished.

DOE has acted to minimize the impact of these security weaknesses at its facilities by establishing multiple layers of protection measures and instituting interim and compensatory measures for identified weaknesses. Additionally, DOE is planning enhancements to the centralized tracking system that should improve its reliability and increase its effectiveness as a management tool.

Background

DOE routinely inspects its facilities to assess their effectiveness in eight overall safeguards and security areas. Inspections are conducted by the Office of Security Evaluations under the Assistant Secretary for Environment, Safety, and Health and the field offices responsible for the facilities. The areas inspected include, among others, nuclear materials control and accountability, protection program operations, computer security, and information security. Each safeguards and security area is further subdivided into numerous safeguards and security activities. For example, activities within protection program operations include physical security systems, protective forces (includes guards, security inspectors, and other personnel employed to protect DOE's security interests), system performance tests, and property protection.

As a result of the inspections, DOE identifies instances of noncompliance with safeguards and security requirements, and/or poor performance of the systems being evaluated (hereinafter termed "weaknesses"). The significance of the weaknesses identified during the various inspections is reflected in ratings that the inspectors assign to the individual safeguards and security activities at each facility. Inspectors use a three-tier system—satisfactory, marginal, and unsatisfactory—to rate the activities. A satisfactory rating indicates that the security activity can meet protection requirements specified in DOE's safeguards and security orders for that activity, even though a deficiency may exist. A marginal rating indicates that because of identified weaknesses, the security activity being evaluated only partially meets the protection requirements specified in the orders. In contrast, an unsatisfactory rating indicates that the security activity being evaluated does not meet specified protection needs. DOE's headquarters program offices and field offices are responsible for ensuring that identified weaknesses are corrected.

The Office of Safeguards and Security in the Office of the Under Secretary, in conjunction with the program offices, is responsible for helping to ensure that weaknesses are corrected. As part of this responsibility, the Office of Safeguards and Security tracks corrective actions and conducts on-site reviews to ensure that weaknesses are corrected pursuant to DOE requirements. One of the management tools used to monitor the weaknesses is a centralized tracking system—the Safeguards and Security Issues Information System. This system categorizes weaknesses in the eight safeguards and security program areas. The system is designed to contain information about the status of each deficiency—whether it has been corrected or not. Responsible offices are required to update the system's information about the status of weaknesses on a quarterly basis.

Weaknesses Identified Across a Wide Range of Security Activities

DOE's Safeguards and Security Issues Information System shows that DOE inspections between January 1989 and September 1990 identified 2,108 weaknesses at the 39 facilities included in our review. For the most part, these facilities are engaged in nuclear materials production and nuclear weapons research and/or manufacture, or they are vital to the administration of the weapons program. About 13 percent of these weaknesses resulted in an unsatisfactory rating for a security activity, such as the performance of security forces. Another 38 percent led to a marginal rating for various security activities. The most frequently identified weaknesses occurred in four of the eight safeguards and

security program areas—protection program operations, nuclear materials control and accountability systems, information security, and computer security activities. Weaknesses were also identified in the other four safeguards and security areas, but to a lesser extent.

Appendix I contains information about the number and types of weaknesses that DOE identified for the 8 safeguards and security program areas at each of the 39 facilities.

Protection Program Operations

Under DOE's safeguards and security orders, the protection program must protect national security and public health and safety from threats associated with the theft or diversion of special nuclear materials and weapons, the compromise of classified information, and the sabotage of DOE facilities and operations. DOE has identified weaknesses in facilities' protection program operations, including physical security systems and professional security forces, that are significant because they lessen DOE's assurances that it will have timely notice of, and an effective response to, such threats.

During calendar year 1989, DOE inspections identified 364 weaknesses in the protection programs at 30 of the 39 facilities included in our review, and another 454 weaknesses at 22 of the facilities during the first 9 months of calendar year 1990. Approximately 16 percent (134) of the total weaknesses (818) resulted in an unsatisfactory rating for a protection program activity at 8 facilities. However, 1 of these facilities accounted for 97 of the 134 unsatisfactory ratings.

Examples of identified weaknesses include the following:

- Noncompliance with the two-person rule for access to nuclear material. This rule requires that two people be present at all times when nuclear material is being accessed or used. The rule's intent is to preclude a single individual from having access to and diverting nuclear material without detection.
- Excessive false alarm rates for the intrusion detection and alarm systems. This is significant because security forces could become inclined to regard the alarms as false, thereby potentially reducing the timeliness and/or effectiveness of their response.
- The inability of members of the security force to appropriately demonstrate such basic skills as the apprehension and arrest of individuals who could represent a threat to security interests. The security force is the line of human defense against terrorist or other attacks, theft or

misuse of classified information and materials, or other adverse actions against DOE facilities. Accordingly, security force members who cannot perform all assigned duties and skills reduce the effectiveness of DOE's protection program.

Nuclear Material Control and Accountability

DOE's material control and accountability procedures and systems are designed to account for, deter, and detect the theft or diversion of nuclear material. These procedures and systems provide assurances that the locations, types, and amounts of such materials are known (within a reasonable level of confidence) and accounted for in DOE's inventory. Compliance with these procedures and activities, such as controls that limit access to nuclear material and procedures to verify material inventories, are critical to the safeguarding of nuclear material. DOE inspections have identified numerous weaknesses in this area.

During calendar year 1989, DOE inspections identified 150 weaknesses in material control and accountability activities at 16 of the 39 facilities included in our review, and another 158 weaknesses at 16 facilities during the first 9 months of 1990. Approximately 10 percent (30) of the total weaknesses (308) led to an unsatisfactory rating for a material control and accountability activity at 2 facilities. Examples of identified weaknesses include the following:

- Instruments that were not properly calibrated were being used for measuring quantities of nuclear materials, thus raising concerns about the accuracy of the measurements of material.
- Procedures for storing nuclear material were not being followed.
- Nuclear material was being received and processed without verification that stated quantities were accurate.

Controls Over Classified Documents

DOE orders on information security require that classified documents and information be safeguarded and controlled to (1) ensure that classified documents are provided only to authorized personnel on a "need-to-know" basis and (2) prevent the loss or compromise of classified information. Such safeguards and controls are necessary to help protect nuclear weapons design and materials information from compromise or use by interests adverse to the security of the United States. However, DOE inspections of facilities during 1989 and 1990 showed that weaknesses exist in how some facilities safeguard classified information.

DOE inspections in calendar year 1989 identified approximately 149 weaknesses in the information security program area at 24 facilities, and during the first 9 months of 1990, 184 weaknesses were identified at 21 facilities. Approximately 18 percent (59) of the total weaknesses (333) resulted in an unsatisfactory rating for an information security activity at 7 facilities. For example, identified weaknesses included the following: some facilities did not establish adequate procedures to account for classified documents and did not enter secret documents into a formal accountability system. Without a formal accountability system, the location and custody of classified information are not known, and such information is not properly controlled.

Computer Security

DOE requires that classified automated data processing systems, including the data they contain, be protected from alteration, disclosure, destruction, or other improper actions as a result of espionage and criminal or other adverse actions. The massive use of automated data processing systems throughout DOE facilities offers an inviting target for individuals who may want to obtain unauthorized access to information for espionage or alter or destroy information stored in the systems.

DOE inspections during calendar year 1989 identified 104 weaknesses in computer security at 17 facilities and 223 weaknesses at 16 facilities during the first 9 months of 1990. Approximately 11 percent (37) of the total weaknesses (327) led to an unsatisfactory rating for a computer security activity at 2 facilities. Such weaknesses reduce assurances that DOE is effectively limiting access to computer systems that process classified information or is adequately safeguarding the information and the computer systems from hostile acts.

Examples of computer security weaknesses include a lack of management plans and procedures, and inadequate access controls at some facilities. DOE also found that some classified computer systems were not being tested to determine compliance with security requirements. Such weaknesses lessen DOE's assurances that information is protected.

Other Safeguards and Security Weaknesses

DOE inspections also identified weaknesses in the remaining four program areas of safeguards and security, including (1) program planning and management, (2) DOE's survey program, (3) personnel security, and (4) operational security. In general, program planning and management include organization and management for providing safeguards and security at DOE facilities, DOE's survey program includes inspections of

facilities and material control and accountability activities, personnel security includes such activities as the personnel security clearance and education programs, and the operational security program is designed to assess vulnerabilities to threats confronting DOE's facilities.

Although weaknesses in these areas occurred less frequently than in the previously discussed safeguards and security areas, they are significant because they further lessen DOE's assurance that security activities are planned to protect against threats, weaknesses in those activities are identified and corrected, timely action is taken on personnel security issues, and facilities' vulnerabilities to threats are identified. In calendar year 1989, DOE identified 132 weaknesses in these areas, and 184 weaknesses during the first 9 months of 1990. Approximately 7 percent (22) of the total weaknesses (316) resulted in an unsatisfactory rating for planning, survey, or personnel activities at 5 facilities. These weaknesses included

- the lack of current physical security plans, which ensure that measures are planned to protect against possible threats, and
- the failure to inspect facilities on schedule and to report to DOE headquarters on the status of corrective actions for identified weaknesses, as required.

DOE's Views About the Impact of Weaknesses on Security

Despite the large number of safeguards and security weaknesses identified at its facilities, DOE believes that security at its facilities is effective against the threat posed by outsiders. According to a DOE official, the agency follows a "defense in depth" philosophy, which provides multiple layers of protection for its security interests, thus reducing the impact of weaknesses. In addition, DOE's Office of Security Evaluations officials have stated that in many cases, effectiveness is achieved by relying on varying degrees of interim and/or compensatory measures. For example, DOE has used manned patrols to compensate for deficiencies in intrusion detection and alarm systems.

Although DOE believes that it has an effective protection program against the overt threat posed by outsiders, it is less certain about protection against the threat posed by insiders. Such individuals pose a special threat to DOE because not only may they have access to vital areas of facilities but they may also be knowledgeable about DOE's protection measures and their weaknesses.

Concern over the insider threat led the Secretary of Energy to report in his 1989 Federal Managers' Financial Integrity Act Statement to the President and the Congress that DOE had a significant internal control weakness in safeguards and security because of weaknesses in providing adequate protection against the potential insider threat. In his report, the Secretary also noted safeguards and security weaknesses such as those discussed above in the areas of physical security, nuclear material control and accountability, classified document control, and access controls. In his 1990 statement, the Secretary, while noting that progress has been made toward correcting the internal control weakness, also identified safeguards and security as a material control weakness. In 1990, the Office of Security Evaluations also expressed concern about the protection of nuclear materials from the insider threat partly because material control and accountability systems did not fully comply with DOE requirements, as determined through the inspection program.

Status of Weaknesses Cannot Be Reliably Determined Through DOE's Tracking System

Although DOE's Safeguards and Security Issues Information System accurately describes the types of weaknesses identified during inspections, it does not have reliable information about the current status of these weaknesses. Accordingly, we could not determine, using the information system, which specific weaknesses have been corrected by field offices and which remain uncorrected; nor could we determine the length of time it has taken DOE to correct weaknesses.

To determine the accuracy of information in the Safeguards and Security Issues Information System, we randomly selected 150 weaknesses from the over 2,100 included in our review and verified the accuracy of the system's information about the types and the status of the 150 weaknesses with the DOE offices responsible for correcting them. According to the offices' responses, descriptive information about the types of weaknesses is accurate. However, we estimate that the status of about 19 percent of the weaknesses in the automated data file is subject to change.¹

Because the offices' responses indicated that the information system does not have current information about whether or not weaknesses have been corrected, we were unable to determine, using the information system, which specific weaknesses DOE has corrected, which ones remain uncorrected, and the time it took DOE to correct them. We can,

¹This estimate has an error rate of plus/minus 6.4 percent at the 95-percent confidence level.

however, use the results of our random sample to estimate the number of corrected and uncorrected weaknesses. We estimate that as of October 31, 1990, either corrective actions had not been completed or DOE had not verified that the corrective actions were effective for approximately 60 percent, or about 1,300, of the 2,100 weaknesses.² (DOE requires field offices to verify that weaknesses are actually corrected before reporting such status information to the Safeguards and Security Issues Information System.)

DOE headquarters Safeguards and Security officials were aware that the information system does not contain up-to-date information about the status of weaknesses. According to these officials, field offices have not updated the information system on a quarterly basis as required by DOE.

In April 1991, DOE officials told us that they were preparing to update the centralized tracking system. However, in September 1991, a DOE official told us that two of nine field offices had not yet updated the system. This official also told us that there was a backlog of inspection findings and corrective actions that had been reported by field offices but they had not been entered into the system because of staffing problems.

In addition to the unreliable status information, DOE's centralized tracking system has limited analytical capabilities and is not used widely to identify trends in weaknesses among the facilities. Such capability is important in identifying similar or recurring problems among the facilities. Without this capability, DOE is hampered in its ability to adequately oversee its safeguards and security program.

Furthermore, in some cases, DOE field offices and their contractors have developed, and in other cases are developing, automated tracking systems to follow up on safeguards and security weaknesses. These systems, however, are compatible neither with each other nor with DOE's centralized tracking system, and as a result, the systems are unable to electronically share information with the centralized information system. Data must therefore be manually entered into both the field office and centralized systems each time the systems are updated. The separate manual entries are costly and increase the opportunities for data entry errors.

DOE officials told us in October 1991 that they are working to develop enhancements to the centralized tracking system to address the above

²This estimate has an error rate of plus/minus 167 weaknesses at the 95-percent confidence level.

limitations of the system. For example, one enhancement will allow field offices to electronically update the centralized tracking system and another will provide management with increased analytical capabilities. These enhancements are to be completed within 18 months.

Conclusions

The grave consequences that could result from terrorist or other hostile acts require that safeguards and security activities be highly effective in protecting DOE nuclear weapons facilities and the nuclear materials they contain from such threats. Although effective safeguards and security are critically important at the applicable facilities, DOE has identified numerous weaknesses that lessen assurances about the effectiveness of its protective measures against all threats, especially against the threats posed by insiders. Moreover, an effective safeguards and security program requires strong oversight to ensure that identified weaknesses involving poor performance of security systems or noncompliance with requirements designed to safeguard materials is corrected. Yet, DOE's centralized tracking system is not an effective management tool for providing strong oversight because it has limited analytical capabilities and unreliable information.

In October 1991, our Information Management and Technology Division issued a report on DOE's security information systems, including the centralized system to track weaknesses.³ The report recommends broad organization and planning improvements to DOE's safeguards and security information systems that should assist DOE in improving the centralized tracking system. For example, the report recommends that one office be responsible for planning and managing security information resources Department-wide. Such an organizational change should help to ensure that (1) information needs of the various security organizations in headquarters and the field are identified and (2) systems' capabilities are planned and obtained to meet those needs, including analytical capabilities and the need to share information. As a result, we are not making recommendations at this time.

Our review relied on computer-generated DOE data on safeguards and security weaknesses. Accordingly, our review included a selected test of the data's reliability. A more detailed discussion of our review objectives, scope, and methodology is included in appendix II.

³Energy Computer Systems: Department of Energy Security Program Needs Effective Information Systems (GAO/IMTEC-92-10, Oct. 22, 1991).

As agreed, we did not obtain written agency comments on a draft of this report. We did, however, discuss the facts presented with responsible DOE officials and incorporated their suggestions where appropriate. In general, these officials agreed with the facts presented. Our work was performed between November 1990 and September 1991 in accordance with generally accepted government auditing standards.

As arranged with your office, we plan no further distribution of this report until 30 days after the date of this letter. At that time, we will send copies to the Secretary of Energy; the National Security Council; the Director, Office of Management and Budget; and other interested parties. We will also make copies available to others upon request.

If you have any questions about the information in this report, please call me at (202) 275-1441. Major contributors to this report are listed in appendix III.

Sincerely yours,



Victor S. Rezendes
Director, Energy Issues

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Abbreviations

DOE	Department of Energy
GAO	General Accounting Office
IMTEC	Information Management and Technology Division
RCED	Resources, Community, and Economic Development Division

DOE's Safeguards and Security Weaknesses

Figures I.1 and I.2 present information on the number and types of weaknesses as well as the number rated as less than fully satisfactory, i.e., both marginal and unsatisfactory ratings, that DOE has identified at the 39 facilities included in our review. The types of weaknesses are categorized according to the following major safeguards and security program areas:

- computer security, which includes management and planning, as well as physical and technical security measures to protect classified computer hardware, software, and the information they contain from unauthorized disclosure or other improper actions;
- information security, which includes the management and control of classified documents and material;
- materials control and accountability, which includes management procedures and controls to detect or deter theft or diversion of nuclear materials and provide assurances that all nuclear materials are present;
- the protection program, which includes physical security systems and human security forces to protect DOE's security interests, such as classified information and nuclear materials, from damaging acts;
- operations security, which includes assessments of vulnerabilities to threats, countermeasures to disrupt or defeat adversaries from exploiting sensitive DOE activities or information, and assurances that such information is not inadvertently released;
- program planning and management, which includes organization and management for providing safeguards and security at DOE facilities, plans for providing security, and procedures to resolve safeguards and security findings;
- personnel security, including personnel security clearance, reinvestigations, and education programs; and DOE's visitor control program; and
- the facility survey and approval program, which includes inspections of facilities and materials control and accountability activities, as well as DOE's process for ensuring that facilities that are approved to possess nuclear materials and classified information and materials have appropriate safeguards and security measures.

Figures I.1 and I.2 also contain an "other" category for findings that did not clearly fit the above major categories.

Appendix I
DOE's Safeguards and Security Weaknesses

Figure I.1: Weaknesses Identified in
Calendar Year 1989

Facility Names
1. Albuquerque Operations Office
2. Kansas City Plant
3. Los Alamos National Laboratory
4. Lawrence Livermore National Laboratory
5. DOE Headquarters - Forrestal
6. DOE Headquarters - Germantown
7. Pinellas Plant
8. Hanford
9. Idaho Nuclear Company
10. Idaho Operations Office
11. Kirtland - Sandia
12. Livermore - Sandia
13. Mound Facility
14. Nevada Operations Office
15. Nevada Test Site
16. Oak Ridge Gaseous Diffusion Plant
17. Oak Ridge National Laboratory
18. Paducah Gaseous Diffusion Plant
19. Portsmouth Gaseous Diffusion Plant
20. Oak Ridge

**Appendix I
DOE's Safeguards and Security Weaknesses**

Facility	Computer Security		Info. Security		Materials Control & Account.		Oper. Security		Protection Program		Program Planning		Personnel Security		Survey Program		Other		Total	
	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory
1	•	•	7	7	•	•	•	•	•	•	2	1	9	6	5	•	•	•	23	14
2	7	•	2	•	•	•	•	•	4	•	•	•	•	•	•	•	•	•	13	•
3	7	•	5	•	9	•	•	•	27	•	2	•	1	•	•	•	2	•	53	•
4	19	15	2	1	14	13	•	•	27	•	3	1	•	•	•	•	•	•	65	30
5	•	•	1	1	•	•	•	•	1	1	•	•	•	•	•	•	•	•	2	2
6	•	•	•	•	•	•	•	•	2	1	1	•	•	•	•	•	•	•	3	1
7	6	•	15	9	•	•	•	•	7	•	1	•	3	•	•	•	•	•	32	9
8	3	•	4	•	25	11	•	•	31	•	6	1	6	3	1	•	•	•	76	15
9	•	•	•	•	•	•	•	•	•	•	1	•	•	•	•	•	•	•	1	•
10	4	•	3	•	•	•	•	•	1	•	1	•	•	•	•	•	•	•	9	•
11	5	•	6	•	•	•	•	•	24	•	•	•	2	•	•	•	•	•	37	•
12	4	1	6	1	•	•	1	•	6	5	1	•	6	5	•	•	•	•	24	12
13	4	•	13	3	•	•	•	•	18	•	•	•	1	•	•	•	•	•	36	3
14	2	•	10	•	•	•	•	•	6	•	•	•	•	•	•	•	•	•	18	•
15	•	•	•	•	•	•	•	•	7	•	1	•	•	•	•	•	•	•	8	•
16	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
17	1	•	•	•	5	•	•	•	8	5	•	•	4	3	•	•	•	•	18	8
18	•	•	7	•	4	•	•	•	10	•	•	•	•	•	•	•	•	•	21	•
19	10	9	7	3	17	9	•	•	7	1	2	2	4	1	•	•	•	•	47	25
20	7	2	7	3	21	5	•	•	23	18	•	•	8	3	1	1	•	•	67	32

**Appendix I
DOE's Safeguards and Security Weaknesses**

Facility Names
21. Oak Ridge Operations Office
22. Pantex Plant
23. Richland Operations Office
24. Rocky Flats
25. San Francisco Operations Office
26. Savannah River Operations Office
27. Savannah River Facility 1
28. Savannah River Facility 2
29. Savannah River Facility 3
30. Savannah River Facility 4
31. Savannah River Facility 5
32. Savannah River Facility 6
33. Savannah River Facility 7
34. Savannah River Facility 8
35. Savannah River Facility 9
36. Savannah River Facility 10
37. Savannah River Facility 11
38. Savannah River Facility 12
39. Fernald

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Facility	Computer Security		Info. Security		Materials Control & Account.		Oper. Security		Protection Program		Program Planning		Personnel Security		Survey Program		Other		Total	
	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory
21	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
22	11	.	5	.	3	.	.	.	27	1	1	.	2	.	.	.	1	.	50	1
23	.	.	2	.	.	.	3	.	.	.	.	.	1	.	.	.	3	1	9	1
24	11	.	11	5	25	23	.	.	51	42	2	2	2	.	.	.	.	.	102	72
25	1	.	13	13	1	1	.	.	6	6	.	.	9	9	7	7	.	.	37	36
26	.	.	1	.	.	.	.	.	.	.	.	.	7	4	8	5	.	.	16	9
27	.	.	.	.	.	.	.	.	9	3	.	.	.	.	.	.	.	.	9	3
28	.	.	2	.	.	.	.	.	10	10	.	.	.	.	.	.	.	.	12	10
29	.	.	.	.	.	.	.	.	12	10	2	.	1	1	.	.	.	.	15	11
30	.	.	1	.	2	.	.	.	12	9	2	.	.	.	.	.	.	.	17	9
31	.	.	.	.	.	.	.	.	5	3	.	.	.	.	.	.	.	.	5	3
32	.	.	.	.	6	.	.	.	4	1	2	.	.	.	.	.	.	.	12	1
33	.	.	.	.	5	.	.	.	.	.	.	.	.	.	.	.	.	.	5	.
34	.	.	.	.	5	5	.	.	3	2	.	.	.	.	.	.	.	.	8	7
35	.	.	.	.	3	.	.	.	1	.	.	.	.	.	1	.	.	.	5	.
36	.	.	2	.	5	4	.	.	2	.	.	.	.	.	.	.	.	.	9	4
37	2	2	17	9	.	.	.	.	8	8	1	.	5	3	1	.	.	.	34	22
38	.	.	.	.	.	.	.	.	5	.	.	.	1	.	1	.	.	.	7	.
39	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
TOTAL	104	29	149	55	150	71	4	.	364	126	31	7	72	38	25	13	6	1	905	340

Figure I.2: Weaknesses Identified in
Calendar Year 1990

Facility Names
1. Albuquerque Operations Office
2. Kansas City Plant
3. Los Alamos National Laboratory
4. Lawrence Livermore National Laboratory
5. DOE Headquarters - Forrestal
6. DOE Headquarters - Germantown
7. Pinellas Plant
8. Hanford
9. Idaho Nuclear Company
10. Idaho Operations Office
11. Kirtland - Sandia
12. Livermore - Sandia
13. Mound Facility
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Facility	Computer Security		Info. Security		Materials Control & Account.		Oper. Security		Protection Program		Program Planning		Personnel Security		Survey Program		Other		Total		
	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	
1	30	28	12	2	.	.	.	.	31	20	3	2	4	1	1	.	.	.	81	53
2
3	8	7	18	.	.	.	.	.	28	25	.	.	2	.	.	.	.	.	56	32
4	29	29	12	12	7	6	.	.	31	27	5	5	3	3	2	2	.	.	89	84	
5	54	54	29	29	16	1	11	11	74	63	6	5	27	5	31	31	.	.	248	199	
6	2	1	.	.	.	.	.	.	15	4	.	.	.	.	.	.	.	.	17	5
7
8	2	.	2	.	.	.	1	.	25	8	2	.	.	.	.	.	.	.	32	8
9
10
11	21	.	8	.	6	3	.	.	21	.	.	.	2	.	.	.	.	.	58	3
12	2	.	8	4	6	.	.	.	.	.	1	.	6	.	.	.	.	.	23	4
13
14	3	.	14	.	.	.	.	.	5	.	1	1	3	2	7	5	.	.	33	8
15	5	.	6	.	3	.	.	.	2	.	1	.	.	.	.	.	.	.	17	.
16	.	.	9	8	25	22	.	.	15	9	1	1	1	1	.	.	.	.	51	41
17
18
19	3	2	3	.	16	15	4	.	16	.	2	1	3	.	1	.	.	.	48	18	
20	5	.	5	5	14	14	.	.	14	8	.	.	.	.	.	.	.	.	38	27

Note: January through September 1990.

Appendix I
DOE's Safeguards and Security Weaknesses

Facility Names
21. Oak Ridge Operations Office
22. Pantex Plant
23. Richland Operations Office
24. Rocky Flats
25. San Francisco Operations Office
26. Savannah River Operations Office
27. Savannah River Facility 1
28. Savannah River Facility 2
29. Savannah River Facility 3
30. Savannah River Facility 4
31. Savannah River Facility 5
32. Savannah River Facility 6
33. Savannah River Facility 7
34. Savannah River Facility 8
35. Savannah River Facility 9
36. Savannah River Facility 10
37. Savannah River Facility 11
38. Savannah River Facility 12
39. Fernald

**Appendix I
DOE's Safeguards and Security Weaknesses**

Facility	Computer Security		Info. Security		Materials Control & Account.		Oper. Security		Protection Program		Program Planning		Personnel Security		Survey Program		Other		Total	
	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory	Total Number of Weaknesses	Less Than Satisfactory
21	5	•	4	•	•	•	•	•	•	•	•	•	•	•	8	6	•	•	17	6
22	5	•	8	•	5	•	•	•	34	21	1	•	•	•	•	•	•	•	53	21
23	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
24	43	33	23	10	9	9	1	•	67	60	8	6	6	•	•	•	•	•	157	118
25	6	6	6	5	•	•	3	•	3	1	1	1	3	•	2	•	•	•	24	13
26	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
27	•	•	8	8	•	•	•	•	6	5	3	3	2	2	•	•	•	•	19	18
28	•	•	•	•	•	•	•	•	4	2	3	3	•	•	•	•	•	•	7	5
29	•	•	•	•	4	•	•	•	•	•	•	•	•	•	•	•	•	•	4	•
30	•	•	•	•	12	3	•	•	14	4	2	2	2	•	•	•	•	•	30	9
31	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
32	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
33	•	•	•	•	7	7	•	•	•	•	•	•	•	•	•	•	•	•	7	7
34	•	•	•	•	15	15	•	•	•	•	•	•	•	•	•	•	•	•	15	15
35	•	•	2	•	•	•	•	•	8	5	2	1	•	•	•	•	•	•	12	6
36	•	•	1	•	3	•	•	•	14	8	2	•	•	•	•	•	•	•	20	8
37	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
38	•	•	3	1	•	•	•	•	16	7	2	1	•	•	•	•	•	•	21	9
39	•	•	3	2	10	4	•	•	11	9	2	2	•	•	•	•	•	•	26	17
TOTAL	223	160	184	86	158	99	20	11	454	286	48	34	64	14	52	44	•	•	1,203	734

Note: January through September 1990.

Objectives, Scope, and Methodology

Our objectives were to obtain information about (1) the number and types of safeguards and security weaknesses that DOE has uncovered at its nuclear weapons facilities and (2) how many of these weaknesses have been corrected, including the length of time DOE has taken to correct them. In order to accomplish these objectives, we selected 39 facilities that are, in general, engaged in nuclear materials production, nuclear weapons research and manufacture, or the administration of the weapons program. We selected these facilities for their importance to DOE's defense program.

For each facility, we obtained information about the number, type, rating, and status of weaknesses identified by DOE between January 1989 through September 1990 from its centralized tracking system—the Safeguards and Security Issues Information System. We used this information to build a data base that allowed us to readily identify areas of security that had the most frequently identified weaknesses, as well as which weaknesses were rated as satisfactory, marginal, or unsatisfactory by DOE.

In order to determine the reliability of the information contained in the system, we selected a statistical sample of 150 weaknesses out of the over 2,100 weaknesses. We asked the applicable DOE offices to confirm the relevant information, including the type of weakness, the facility that had the weakness, when the weakness was identified, the rating of the weakness, and its status. We used the field offices responses to our random sample test to estimate the number of corrected and the number of uncorrected weaknesses. We did not independently verify that the information system contained all findings associated with the facilities. However, the number and diversity of weaknesses contained in the information system provide a good understanding of the problems facing DOE in the safeguards and security area.

Since we used a sample (called a probability sample) of 150 weaknesses to develop our estimates, each estimate has a measurable precision, or sampling error, which may be expressed as a plus/minus figure. A sampling error indicates how closely we can reproduce from a sample the results that we would obtain if we were to take a complete count of the universe using the same measurement methods. By adding the sampling error to and subtracting it from the estimate, we can develop upper and lower bounds for each estimate. This range is called a confidence interval. Sampling errors and confidence intervals are stated at a confidence level—in this case 95 percent. For example, a confidence interval, at the 95-percent confidence level, means that in 95 out of 100 instances,

the sampling procedure we used would produce a confidence interval containing the universe value we are estimating.

We discussed the facts presented in this report with DOE officials in the Office of Safeguards and Security. They generally agreed with the information but offered some clarifications, which we incorporated where appropriate. Our work was conducted between November 1990 and September 1991 in accordance with generally accepted government auditing standards.

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